Section-A(MCQ's)

Q.1 Choose the correct answer for each from the given options:

(i) In a right angle traingle the side opposite to right angle is called ________.
(a) Perpendicular (b) Hypotenuse (c) Altitude (d) Base

(ii) The point through which bisectors of angles ofa triangle pass is called:
(a) Incentre (b) Orthocenter (c) Centroid (d) None of these

(iii) $1+\tan^2 45^\circ = \sec^2$ ________.
(a) 30° (b) 45° (c) 60° (d) 90°

(iv) $\sin 30^\circ = \cos$ ________.
(a) (a) 30° (b) 45° (c) 60° (d) None of these.

(v) A line which intersect a circle at one and only one point is called _____ to the circle.
(a) Radial Segment (b) Secant (c) Semi-circle (d) Tangent

(vi) If a, b and c are in continued proportion, then ________.
(a) $ab = c^2$ (b) $a^2 = bc$ (c) $ac = b^2$ (d) None these

(vii) The mean proportion to 75 and 12 are
(a) ±20 (b) ±10 (c) ±30 (d) ±40

(viii) A series contains values 15, 19,13,11,14,16, its median is:
(a) 12 (b) 13 (c) 14 (d) 14.5

(ix) Order of $\begin{bmatrix} \sqrt{3}+2 \\ 5+7 \end{bmatrix}$ is ______.
(a) 2 x 2 (b) 1 x 2 (c) 2 x 1 (d) None of these

(x) $(x-6)(x-4) =$ ________.
(a) $x^2 - 10x - 24$ (b) $x^2 + 10x - 24$ (c) $x^2 - 24x + 24$ (d) $x^2 - 10x + 24$

(xi) If $A = \begin{bmatrix} 6 & 4 \\ 3 & 2 \end{bmatrix}$, then $|A| =$ ________.
(a) 0 (b) 2 (c) 4 (d) 6

(xii) $ax^2 + bx + c = 0$, will remain quadratic equation , if
(a) $a \neq 0, b = 0$ and $c = 0$ (b) $a = 0,\ b \neq 0$, and $c \neq 0$
(c) $a \neq 0$, and $c = 0$ (d) Both (a) and (c)

(xiii) If R = {(1,2), (2, 3), (3, 4)}, then Range R = ________.
(a) { 1, 2, 3} (b) { 2, 3, 4} (c) { 1, 2, 3, 4} (d) None of these

(xiv) If $\log_2 x = 3$, then x = ________
(a) 6 (b) 8 (c) 10 (d) 5

(xv) $\frac{a^m}{a^n} =$ ________.
(a) a^{m+n} (b) $a^{m \times n}$ (c) a^{m-n} (d) $a^{\frac{m}{n}}$

(xvi) The degree of the polynomial $x^2 + xy^2 + y$ is:
(a) 2 (b) 3 (c) 4 (d) 1

(xvii) The L.C.M of $x^2 - y^3$ and $x^6 - y^6$ is ________.
(a) $x^3 - y^3$ (b) $x^3 + y^3$ (c) $x^6 + y^6$ (d) $x^6 - y^6$

(xviii) If the sum of two angles is 90° then they are called ________.
(a) Vertical Angles (b) Adjaceant Angles (c) Complementary Angles
(d) Supplementary Angles.

(xix) If the vertex and one arm of two angles are common, they are called _____.
(a) Vertical Angles (b) Adjacent Angles (c) Corresponding Angles
(d) Alternate Angles

(xx) A quadrilateral having only one pair of opposite sides parallel is called ________.
(a) Rhombus (b) Trapezoid
(c) Rectangle (d) Parallelogram

Section-B

Note: Solve any TEN of the following questions. Each question carries 05 marks.

Q.2 Define Median and give its merits and demerits.

Q.3 Find the square root of $\left(x+\frac{1}{x}\right)^2 - 4\left(x-\frac{1}{x}\right)$

Q.4 Prove that: $\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = 2\sec^2\theta$

Q.5 Simplify: $\frac{(27)^{\frac{2n}{3}} \times (8)^{-\frac{n}{3}}}{(18)^{-\frac{n}{2}}}$

Q.6 Define any Two of the following and draw the figure.
Trapezoid Circum circle of a triangle Adjacent Angles

Q.7 Find the H.C.F of the polynomials by division method`:
$4x^3 - 3x^2 - 24x - 9$ and $8 x 3 - 2x^2 - 53x - 39$

Q.8 If A = {a, b}, B = {2, 3} and C = { 3, 4} then find A x (B - C) and A x ($B \Delta C$)

Q.9 Prove that: $\log_b m = \log_a m . \log_b a$

Q.10 Find the value of $x^3 + y^3$ when x + y = - 5 and xy = 8.

Q.11 Two numbers are in the ratio 7:8 and their sum is 105. Find the nubmers.

Q.12 Solve the equations by using Crámer's rule. 2x + 5y = 9, 4x - 2y = 1

Q.13 Prove that, if a perpendicular is drawn from the centre ofa circle to a chord, it bisects the chord.

Q.14 Eliminate x form the equations: $x + \frac{1}{x} = 2p,\ x - \frac{1}{x} = 2q + 1$

Q.15 Solve the equation by completing square: $2x^2 + 10x - 48 = 0$

Section-C

Note: Solve the THREE of the following questions. Each question carries 10 marks.

Q.16 (a) Simplify: $\frac{x+2y}{x^2 - xy} \div \frac{x^2 + 4xy + 3y^2}{x(x^2 - y^2)}$

(b) Solve the equation $5x^2 + 11x = 4(3x+1)$ with the help of quadratic formula.

Q.17 (a) Prove that, if a side of a triangle is extended, the exterior angle so formed is, in measure, greater than either of the two interior opposite angles.

(b) Find the factor of $x^3 - x^2 - 14x + 24$ with the help of remainder theorem.

Q.18 (a) Find all the values of trigonometric ratio of 45°.

(b) Find the value of $\frac{\sqrt{431.5 \times (1.2)^2}}{\sqrt[3]{36.98}}$ with the help of logarithm.

Q.19 (a) On the bank of a sea, there is a light house, 100m high. The angle of depression of a ship from the top fo the light house is of 45°. Fidn the distance betwee the foort of the light house and the ship.

(b) If $A = \begin{bmatrix} 3 & 2 \\ 5 & 4 \end{bmatrix}$, then find A^{-1}.

Q.20 Construct a triangle ABC in which $m\overline{AB} = 5cm$, $m\angle B = 105^\circ$ and $m\overline{BC} = 4cm$. Draw its escribed circle opposite to the $\angle A$.